

Amendments to the Specification

The specification has been amended to reference the patent number of a cited patent application, and to correct a typographical error (missing comma). No new matter is added by the amendments.

Amendments to the Claims

Claims 2, 4, 5, 8, 10, 11, 15-24, 26 and 29-36 have been amended. In particular, claims 2, 4, 5, 8, 10, 11, 15-24, 26 and 29-36 have been amended to depend from one or more of the new claims, and to be consistent therewith. In addition, claim 2 has been amended to include, in the alternative, the requirement of cancelled claim 3. Claims 10 and 11 have been amended to clarify that the various components are delivered in different amounts. Claims 15-20 have been amended, consistent with new independent claims 42 and 43, to clarify that the required number of different materials comprise a layer. Claim 23 has been amended to positively require that the substrate be physically masked while delivering one or more components of one or more materials to a region of the substrate. Claim 24 has been amended to remove the sole parenthetical abbreviation "CVD" to be consistent with the other recited delivery techniques. Claim 29 has been amended to depend from claim 43 (rather than claim 27), and to positively require the step of determining the relative performance of the first and second materials with respect to the useful property of interest. Claims 30-35 have been amended to incorporate, in the alternative, the requirements of as-filed claims 36-41 and to clarify that ten or more materials can include the required number of components or a greater number thereof. Claim 36 has been amended to require that each of the ten or more materials have three or more components.

Each of the amended claims are fully supported by the original claims alone or in conjunction with the specification. No new matter has been added.

Each of the amendments to the claims has been made to more particularly point out and distinctly claim the subject matter which the Applicants regard as their invention. By such amendments, the Applicants in no way intend to surrender any range of equivalents beyond that which is needed to patentably distinguish the claimed invention as a whole over the prior art. Applicants expressly reserve patent coverage to

all such equivalents that may fall in the range between applicants literal claim recitations and those combinations taught in the prior art.

Cancelled Claims

Claims 1, 3, 6, 7, 9, 12-14, 25, 27, 28 and 37-41 have been cancelled, without prejudice, and some of the requirements thereof have been included in the amended claims and/or in the new claims.

New Claims

New claims 42-73 have been added. Briefly, new independent claims 42, 68, 70 and 72 require forming materials that comprise two or more layers. Unlike as-filed claim 1 (now cancelled), however, these independent claims do not require interaction of components or other particular manner of forming such a layer. New claims 43-67, 69, 71 and 73 each depend from independent claims 42, 68, 70 or 72 or from another claim dependent therefrom, and are directed to further-characterized methods of the invention.

Each of the new claims are fully supported by the specification, including the original claims set forth therein. No new matter has been added.

Response to Restriction

The Office action sets forth an election of species requirement that requires the Applicant to elect a single species with respect to the techniques for delivering components of the materials to the substrate. See Office action at page 2. Claim 24 is said to be generic. *Id.*

Applicants hereby elect, without traverse, to prosecute the claims covering the patentably distinct species of delivering components using electron beam evaporation techniques.

All of the presently pending claims, 2, 4, 5, 8, 10, 11, 15-24, 26, 29-36, and 42-73 read on the elected species. Claims 2, 4, 5, 8, 10, 11, 15-24, 26, 29-36, 42-65, and 67-73 are generic to the elected species. Claim 66 reads specifically on the elected species.

Rejections Under 35 USC 112, 1st Paragraph (Enablement)

The Office action has rejected claims 1-41 for lack of enablement under the first paragraph of 35 USC 112. The Office action states that the specification “does not reasonably provide enablement for making an array of any type of materials as broadly as called for in the claims.” See page 4 of the Office action (“Rejection A”). The Examiner notes that the interaction between components, where required (e.g., as-filed claim 1), is not limited to chemical interaction (e.g., reaction), but can also include non-chemical interaction. *Id.* The Office action posits that the specification “does not provide sufficient guidance to one having ordinary skill in the art to practice the invention as claimed with a reasonable expectation of success without an undue amount of experimentation.” *Id.* In particular, it is asserted that “(t)here is no teaching in the specification of how to obtain (sic: materials) different materials by combining two components of two materials by non-chemical means.” *Id.* at page 5.

Applicants acknowledge that the Examiner considers the specification to be enabling for “specific materials exemplified in the specification”, including materials formed by “chemical synthesis of compounds.” See pages 4 and 5 of the Office action. Applicants respectfully point out, in this regard, that new claim 49 positively requires that the components react with each other to form the different materials. As such, the scope of claim 49 is within that which is considered enabled in the Office action.

Hence, at issue is whether the other pending claims are enabled by the specification, and particularly, whether a person of ordinary skill in the art would have been enabled by the specification to make an array of diverse materials – and specifically, to make such an array by methods that encompass non-chemical interaction between components.

Applicants respectfully submit that the instant rejection under 35 USC 112 should be withdrawn for the reasons set forth below.

A Prima-Facie Case of Non-Enablement Has Not Been Established

The Office action does not set forth a *prima facie* case of non-enablement. To question enablement, the law requires a reasoned basis for doubting the objective truth

of statements made in the specification that are consistent in scope with the language employed in the claims. Specifically, it is well-established that

a specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented *must* be taken as in compliance with the enabling requirement of the first paragraph of Sec. 112 *unless* there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support.

See *In re Marzocchi*, 169 USPQ 367, 369 (CCPA 1971) (emphasis in original). As explained further by the *Marzocchi* court, and as summarized in the MPEP:

(I)t is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain *why* it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement.

See MPEP Sec. 2164.04, citing *In re Marzocchi*, *Id* at 370 (emphasis in original).

In the present case, the specification teaches how to make a spatially addressable array of diverse materials in terms which correspond to the scope of the terms used in the claims. See, particularly, page 19, line 31 through page 20 at line 16 of the specification (discussing interaction of components by chemical and non-chemical (e.g., physical) means – such as reacting, interdiffusing, etc.). See, also, for example, page 27, line 31 through page 53, line 11 of the specification (discussing generally applicable methods for delivering components to the substrate), and especially, page 61, line 21 through page 65, line 8 of the specification (discussing applications of such methods to form materials comprising layers, mixtures and/or composites). Such teaching, under *Marzocchi*, must be taken as enabling in the present case, because the Office action does not set forth any basis for doubting the objective truth of such teaching. The Office action presents only conclusory arguments that the level of guidance is insufficient, and that the full scope of the claims are not enabled. Significantly, the Office action does not provide any reasoned, technical basis for the asserted conclusions, and moreover, does not cite any technical literature (patents or journal publications) that would support such conclusions.

Hence, the Office action does not establish, *prima facie*, that a skilled artisan

would have required undue experimentation to practice the full scope of the invention as presently claimed. Accordingly, withdrawal of the instant basis for rejection is appropriate.

The Full Scope of the Presently-Claimed Invention is Enabled

Even if the Office action is considered, *arguendo*, to have set forth a *prima facie* case of non-enablement, the Applicants respectfully assert that the specification would have enabled a person of skill in the art to make an array of diverse materials having the features presently required by the claims. In particular, the specification is enabling with respect to each of the pending claims – regardless of whether or not the claims require the components for such materials to interact at all, and specifically, regardless of whether the claims require the components to interact by chemical or non-chemical means.

The guidance provided by the specification, together with the ordinary knowledge and skill of the art, enable the present invention. Methods for delivering one or more components to substrates are extensively known in the art. The specification provides substantial guidance as to how many of such generally known methods can be applied to deposit various components onto distinct regions of a substrate. See, generally, for example: page 19, line 31 through page 20, line 8; page 21, line 19 through page 22, line 31; page 27, line 30 through page 49, line 17; and the *Handbook of Thin-Film Deposition Processes and Techniques*, K. Schuegraf, Ed., Noyes Publications (1988) and references cited therein (incorporated by reference at page 28, lines 20-24 of the specification). See, especially, for example: page 61, line 21 through page 62, line 8; page 64, line 4 through page 65, line 8; and page 65, line 28 through page 66, line 14. Additionally, the specification clearly teaches that once such components are deposited, they can interact or not, and if they interact, such interaction can be by reaction, interdiffusing, intermingling, *etc.* A skilled artisan will readily appreciate, for example, that in many cases, interaction between components will occur inherently – without any further positive steps. For example, a particular material may be formed by depositing its components into a common region of the substrate, and allowing those components to form layers with each other, to mix with each other, to

diffuse with respect to each other, to react with each other, *etc.* – without taking positive actions to effect a particular type of interaction. It will likewise be appreciated by a person of skill in the art that, in other cases, positive steps can be taken to effect an interaction. The specification provides substantial guidance with respect to a number of well-known steps that can be employed during or after delivery of the components to enhance such interaction. See, for example: page 20, lines 8-17; page 49, line 18 through page 53, line 11; page 59, lines 7-19; and page 62, line 9 through page 64, line 3. The aforementioned support is to be considered exemplary and non-limiting. Further support can also be found in the specification.

It is of central importance, however, to understand that the particular mode of interaction which occurs between components is not generally of concern to the invention. With the exception of new claim 49, the presently-claimed invention does not require one particular mode of interaction over other possible modes. Whether one or more of the modes of interaction described in the specification, or other modes not described therein, in fact, occur or do not occur, is irrelevant to all claims except claim 49 – which specifically requires reaction between components. As such, there is no requirement in the law to enable a skilled artisan to preferentially effect one mode of interaction over another.

While the claims are admittedly broad with respect to the types of materials being formed, the components from which such materials are formed, the method for delivering such components, and the potential interactions between such components while forming the materials, such breadth is appropriate in view of the extremely vast warehouse of knowledge regarding such materials, components and methods. When such extensive knowledge of the art is considered in combination with the guidance provided in the specification, particularly with respect to other features of the claims (*e.g.*, forming diverse materials as two or more layers at distinct regions of a common substrate), the presently pending claims are clearly enabled. Accordingly, withdrawal of the present rejection is appropriate.

Rejections Under 35 USC 112, 2nd Paragraph (Indefiniteness)

The Office action has also rejected claims 1-41 as being indefinite under the

second paragraph of 35 USC 112. It is said in the Office action that the “claims do not distinguish between the starting materials and the final product materials” and it is noted that the “first and second materials can themselves be different.” See Office action at page 5 (“Rejection B”). With respect to claim 23, it is said that the expression “involving the use of a physical mask” is vague and indefinite. *Id.* Claim 25 is said to be vague with respect to the phrase “screening said array of materials for a useful property” because it is not clear what useful property is intended. *Id.*

As amended, the claims particularly point out and distinctly claim the invention. Specifically, the amended claims clearly delineate between “starting materials” (e.g., various components of the various materials) and the resulting “final materials” (e.g., the materials themselves – formed from their respective components). Although the claims vary with respect to their breadth (e.g., claim 46 requires that the components *interact* to form the materials, whereas claims 42, 68 and 70 do not require such interaction between components), such variation in breadth does not make the claims indefinite. Moreover, each of the claims positively require that at least ten of the materials formed on the substrate (e.g., the first material, the second material, *etc.*) are different materials with respect to each other. Hence, it is respectfully asserted that the claims, as presently pending, comply with the requirements of the second paragraph of 35 USC 112 with respect to the aforementioned concerns.

Claim 23 has been amended to positively require physical masking of the substrate during delivery of one or more components of the various materials to a region of the substrate. “Physical masking” is a term of art with an accepted meaning. Physical masking methods are generally known in the art, and exemplary physical masking approaches are particularly described in the specification in connection with the present invention. See, for example: page 28, line 25 through page 31, line 24; and page 31, line 29 through page 37, line 12.

Claim 25 has been cancelled. The requirements of claim 25, however, have been substantially included in new claims 43 and 69. To the extent the concern raised in the Office action with regard to claim 25 is considered applicable to presently pending claims 43 and 69, Applicants respectfully assert that the claims, as presently pending, are not indefinite with respect to screening the materials “for a useful property

of interest.” A person of ordinary skill in the art can readily delineate whether or not they are screening materials for a useful property – that is, for a particular quality, trait or function that is useful in (or that imbues the material with utility in) a particular application. Properties of particular interest are well-known in the art for many classes of materials. Moreover, the specification provides substantial guidance with respect to delineating properties of interest. For example, properties can be broadly classified as including electrical, thermal, mechanical, morphological, optical, magnetic and/or chemical properties. See, for example, page 53, lines 27-28. An extensive, more specific, non-limiting list of “useful properties” is also set forth. See, for example, Table 1 on pages 54 and 55 of the specification. In view of the knowledge in the art, and the guidance presented by the specification, persons of ordinary skill have a clear understanding of what is and what is not a “useful property”; the term adequately defines the metes and bounds of the invention. Hence, the requirement to screen the materials for one or more useful properties of interest, although admittedly broad with respect to the properties, has a definite and well-understood meaning in the art. See *In re Gardner*, 166 USPQ 138, 140 (CCPA 1970) (explaining that breadth is not indefiniteness). As such, this requirement cannot be considered to be indefinite.

Acknowledgement

Applicants acknowledge that the Examiner has considered the prior art of record, and has not made any art-based rejections of the as-filed claims. Applicants submit that the new independent claims, and the as-amended dependent claims are novel and non-obvious over the art of record.

In view of the foregoing, Applicants submit that each of the pending claims are now in condition for allowance, and request notice of the same.

The Examiner is hereby authorized to charge the amount of \$619.00 for the fee required under 37 CFR §1.16(b), 1.16(c), and 1.16(d) to Deposit Account No. 50-0496. The Examiner is also authorized to charge any underpayment or to credit any overpayment for the above referenced fees and/or the present Amendment to the

aforementioned Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul A. Stone". The signature is stylized with large, sweeping loops and a prominent "P" at the beginning.

Dated: 8.31.99

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